WOLF CREEK
NUCLEAR OPERATING CORPORATION

Britt T. McKinney
Vice President Plant Operations and Plant Manager

OCT 4 2000

WO 00-0039

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 2000-003-00

Gentlemen:

The enclosed Licensee Event Report (LER) 2000-003-00 is being submitted, pursuant to 10 CFR 50.73(a)(2)(iv), regarding a unit trip due to a failure of the Unit Auxiliary Transformer and accompanying fire at Wolf Creek Generating Station. The LER also reports a subsequent Engineered Safety Feature actuation.

The attachment to this letter identifies the actions committed to by Wolf Creek Nuclear Operating Corporation in the enclosed LER.

If you should have any questions regarding this submittal, please contact me at (316) 364-4112, or Mr. Tony Harris at (316) 364-4038.

Very truly yours,

Britt T. McKinney

BTM/rlr

Enclosure
Attachment

cc: J. N. Donohew (NRC), w/e, w/a
W. D. Johnson (NRC), w/e, w/a
E. W. Merschoff (NRC), w/e, w/a
Senior Resident Inspector (NRC), w/e, w/a

IE22

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001
Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
WOLF CREEK GENERATING STATION	05000482	1 OF 5

TITLE (4)
Unit Trip Due to a Failure of the Unit Auxiliary Transformer and Accompanying Fire Caused by a Squirrel; Engineered Safety Function Actuation

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV. NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	4	2000	2000	003	00	10	04	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	MODE 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)											
POWER LEVEL (10)	100%		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)				
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)				
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER				
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)						
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)						
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)						

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Karl A. (Tony) Harris Manager Regulatory Affairs	(316) 364-4038

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
C	EA	Med-Voltage Power Sys. (601V-35kV)		yes		EL		Main Gen Output Power		

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES	X	NO				

ABSTRACT (16):

On September 4, 2000, at 1132, Wolf Creek Generating Station (WCGS) experienced a fire on the Unit Auxiliary Transformer. This resulted in a momentary degraded condition for the station service loads. The "C" and "D" Reactor Coolant Pumps (RCP) tripped on under voltage, which resulted in a reactor trip. A turbine trip then followed. The fire on the transformer was extinguished by installed plant fire suppression equipment, and was declared "out" at 1143. The plant was stabilized at 2235 psig in the Reactor Coolant System. Other actuations were feedwater isolation and actuation of both motor and turbine driven auxiliary feed pumps due to low steam generator water level. These actuations were expected, and safety equipment performed as designed. The fast bus transfer to the start-up transformer source performed consistent with its design. Immediate investigation revealed what appeared to be a dead squirrel below the Transient Recover Voltage (TRV) Capacitor Bank associated with the PA02 side of the Unit Auxiliary Transformer. The root cause is that the Unit Auxiliary Transformer was not designed to be resistant to small animal intrusion. Corrective actions include installing insulating materials on the Unit Auxiliary Transformer and its TRV capacitor banks, and installing insulating material on the Startup Transformer and capacitor banks. On September 4, 2000, at 1424, a separate Feedwater Isolation Signal occurred. The root cause of this subsequent event was a misleading procedure step, which will be clarified.

Plant Conditions Prior to the Event:

Mode -- 1
Power -- 100 percent
Temperature -- 586.2 degrees Fahrenheit
Pressure – 2238.2 pounds per square inch gauge

Basis for Reportability:

As discussed in NUREG-1022, Revision 1, actuation of an engineered safety feature (ESF) is reportable under the provisions of 10 CFR 50.72(b)(2)(ii) as a four-hour call (event #37287), and also under the provisions of 10 CFR 50.73(a)(2)(iv). During this event, ESF actuations, including the plant trip, occurred as the result of a fire on the Unit Auxiliary Transformer caused by a squirrel which had bridged the gap between one phase and ground, or between two phases on the Unit Auxiliary Transformer Transient Recover Voltage capacitor bank. NUREG-1022 further indicates that the later engineered safety function (ESF) actuation is reportable in accordance with 10 CFR 50.72(b)(2)(ii) as a four-hour call (event #37323), and also in accordance with 10 CFR 50.73(a)(2)(iv) during plant conditions such as WCGS experienced on September 4, 2000.

Event Description:

On September 4, 2000, at 1132, Wolf Creek Generating Station (WCGS) experienced a fire in the Unit Auxiliary Transformer (UAT). This resulted in a momentary degraded condition for the station service loads, PA bus, "P" standing for non safety related, and "A" standing for 13.8 kV. The "C" and "D" Reactor Coolant Pumps (RCP) tripped on under voltage, which also resulted in a reactor trip. A turbine trip then followed. The fire in the transformer was extinguished by installed plant fire suppression equipment, and was declared "out" at 1143. The WCGS Fire Brigade and the Coffey County Fire Department responded to the event.

The plant was stabilized at 2235 psig in the Reactor Coolant System. The Reactor Coolant System temperature was maintained by condenser steam dumps. Steam generator levels were maintained between 40% and 50% narrow range level using auxiliary feedwater. Pressurizer level was stable at 23%. Other actuations were feedwater isolation, and auxiliary feed actuation on both motor and turbine driven auxiliary feed pumps, due to low steam generator water level. These actuations were expected, and safety equipment performed as designed.

At 1400, Wolf Creek Nuclear Operating Corporation personnel informed the NRC Operations Center (event #37287) of the reactor trip.

On September 4, 2000, at 1424, while in Mode 3, the indicated narrow range (NR) level in the "B" steam generator (SG) reached 78%, causing a Feedwater Isolation Signal (FWIS). WCNOC personnel were restoring normal feedwater. The motor-driven Startup Main Feedwater Pump (S/U MFP) had been started, and the "A", "B", and "D" Feedwater Isolation Valves (FWIVs) were opening. Shortly after opening the FWIVs, the water level in "A", "B", and "D" SG began to increase. The level in SG "B" increased most rapidly. When the NR level in the "B" SG reached approximately 70%, the operators shut down the S/U MFP. Just as the level in the SGs had

stopped climbing, the steam dump valves opened, causing the level in all of the SGs to increase due to swell. The indicated level in the "B" SG briefly exceeded 78%, causing a Turbine Trip signal and the FWIS actuation to occur.

Root Cause:

Reactor Trip

Performance Improvement Request 2000-2462 was initiated to determine the root cause and corrective actions for this event. The immediate investigation revealed a dead squirrel below the Transient Recover Voltage (TRV) Capacitor bank associated with the PA02 side of the Unit Auxiliary Transformer. The squirrel apparently made contact with the connections of the capacitors on the transformer which feeds the PA02 bus, causing a degraded voltage condition. Personnel have been unable to determine how a squirrel accessed energized equipment on the Unit Auxiliary Transformer. The root cause is that the bare metal leads on the Unit Auxiliary Transformer were not designed to be small animal proof.

Feedwater Isolation Signal

Performance Improvement Request 2000-2575 was initiated to determine the root cause and corrective actions for this event. Following a reactor trip, Operations procedure GEN 00-005, "Minimum Load to Hot Standby," allows the Control Room operators to use the Main Feed Regulating Valves (MFRVs) as isolation devices. The MFRVs should not be depended upon for isolation of feedwater flow. Therefore, the root cause of the FWIS is a procedural step which recommends, but does not require, MFRV manual isolation.

Corrective Actions Taken:

Reactor Trip

Immediate Corrective Actions:

WCNOC personnel completed a temporary modification package that allows the unit to operate on the Startup Transformer on an interim basis, while repair/replacement of the UAT is completed. The unit was returned to full power at 1304 on September 7, 2000. The damage to the UAT was inspected. The inspections identified phase to ground and phase to phase faulting, indicative of faulting that would be initiated by a small animal. Initial repair efforts were completed on the transformer secondary bushings to facilitate further testing of the UAT. Testing indicated that the UAT transformer windings were damaged from the event. The UAT is being removed for further repair or replacement. The UAT is expected to be returned to service Spring, 2001.

Actions to Prevent Recurrence: The goal of the corrective actions to prevent recurrence is to make the WCGS equipment less vulnerable to small animal intrusion. Three corrective actions are planned:

- WCNOC will install insulating materials to the Unit Auxiliary Transformer and its TRV capacitor banks prior to returning the UAT to service.

- Western Resources Design Engineering will evaluate the use of insulating materials on the #7 transformer, bus work, and capacitor bank to determine the appropriate changes to be made, and to install those changes.

- Insulating material will be installed on the Startup Transformer and capacitor banks.

Feedwater Isolation Signal

Immediate Corrective Actions

- The Control Room Operators dispatched personnel to isolate the Main Feedwater Regulating Valves.

- Auxiliary Feedwater flow was adjusted to maintain SG levels.

Actions to Prevent Recurrence:

- GEN 00-002, COLD SHUTDOWN TO HOT STANDBY, will be revised to require isolation of the Main Feedwater Regulating Valves prior to opening the Feedwater Isolation Valves.

- GEN 00-005, MINIMUM LOAD TO HOT STANDBY, will be revised to require isolation of the Main Feedwater Regulating Valves following a reactor trip but prior to re-opening of the Feedwater Isolation Valves.

Safety Significance:

The safety significance of the trip event has been evaluated and determined to be minimal, although any challenge causing a plant trip is not desirable. All safety equipment performed as designed and there were no adverse effects on the health and safety of the public.

As a result of the fault associated with the Unit Auxiliary Transformer, the reactor coolant pumps "C" and "D" tripped off, and the reactor tripped. The reactor trip caused main feed isolations to close, and the auxiliary feed system activated to provide safety related feedwater. One PORV lifted one time due to reduced spray flow (result of "D" RCP trip). Operators were able to restart the reactor coolant pumps.

The fast bus transfer between PA0101 and PA0110 on PA01 was successful. The fast bus transfer between PA0211 and PA0202 on PA02 operated as designed, but was not completed before degraded voltage conditions extended to all buses downstream of PA02. The fault started on the X winding (PA02) side allowing for a greater time before the transfer occurred. All protective relay functions on the downstream buses (PB04, SL-2, SL-4, SL-4A) and loads (RCP C & D) operated per design to prevent inadvertent equipment damage.

The safety significance of the engineered safety feature (ESF) actuation on the Feedwater Isolation Signal (FWIS) has also been evaluated. The Turbine Trip and FWIS that occurred mitigated no ongoing adverse condition. The Main Turbine was isolated from the steam lines at the time of this event, giving no opportunity for water intrusion to damage the turbine. Although, to some degree, feedwater flow had been more than was

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Wolf Creek Generating Station	05000482	2000	003	00	5 OF 5

TEXT *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

necessary immediately prior to the FWIS, the Control Room operators had regained control of feedwater flow before the time the steam dumps opened causing the indicated level to swell above 78%. No excessive primary system cooldown was occurring at the time of this event.

Previous Occurrences:

Previous LERs were reviewed for the years 1997, 1998, and 1999, for events of similar root cause, i.e., an animal causing a plant trip. LER 1999-005-00 reported that a raccoon caused the loss of the #7 transformer in the switchyard, which activated the plant safety equipment, but did not cause a plant trip. Snake fencing and gravel backfill around the switchyard was installed after that event.

WCNOC LERs were reviewed for the previous three years; no reports were identified for feedwater isolation actuations.

LIST OF COMMITMENTS

The following table identifies those actions committed to by Wolf Creek Nuclear Operating Corporation (WCNOC) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Mr. Tony Harris, Manager Regulatory Affairs at Wolf Creek Generating Station, (316) 364-4038.

COMMITMENT	Due Date/Event
WCNOC will install insulating materials to the Unit Auxiliary Transformer (UAT) and its TRV capacitor banks.	Prior to returning the UAT to service
Western Resources Design Engineering will evaluate #7 transformer, bus work, and capacitor bank to determine the appropriate changes to be made, and to install those changes.	Refuel XII
Insulating material will be installed on the Startup Transformer and capacitor banks.	Refuel XIII
Revise GEN 00-002, COLD SHUTDOWN TO HOT STANDBY, to require isolation of the Main Feedwater Regulating Valves prior to opening the Feedwater Isolation Valves.	11/1/2000
Revise GEN 00-005, MINIMUM LOAD TO HOT STANDBY, to require isolation of the Main Feedwater Regulating Valves following a reactor trip but prior to re-opening of the Feedwater Isolation Valves.	11/3/2000